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RESEARCH REPORT

CONSIDERATIONS FOR ROYAL AUSTRALIAN AIR FORCE

OPERATIONS IN THE NORTH OF AUSTRALIA

WING COMMANDER JONATHAN S. HAMWOOD, RAAF

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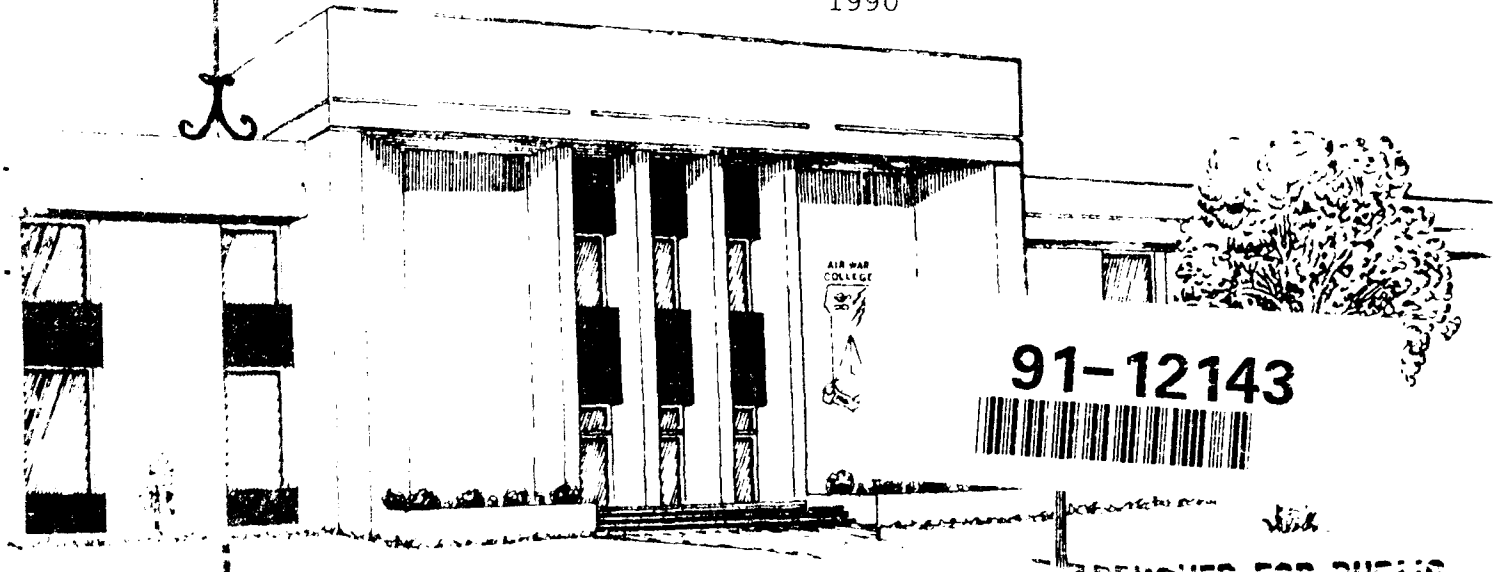

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MAXWELL AIR FORCE BASE, ALABAMA

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CONSIDERATIONS FOR ROYAL AUSTRALIAN AIR FORCE OPERATIONS IN THE NORTH OF AUSTRALIA

by

Jonathan S. Hamwood

Wing Commander
Royal Australian Air Force

A DEFENCE ANALYTICAL STUDY SUBMITTED TO THE FACULTY

IN

FULFILLMENT OF THE CURRICULUM REQUIREMENT

Advisor: Dr. David E. Albright

MAXWELL AIR FORCE BASE, ALABAMA

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EXECUTIVE SUMMARY

TITLE: Considerations for Royal Australian Air Force Operations in the North of Australia.
AUTHOR: Jonathan Hamwood, Wing Commander, RAAF

Recently enunciated defence policy in Australia has swung the focus of interest towards the north and surrounding offshore areas. This region has been long neglected from both a defence and infrastructure point of view because of its harsh climate and the vast distances involved. If the RAAF is to be able to operate effectively throughout this region and provide the degree of security only air power can offer, it must come to grips with the peculiarities of this environment. The process may be costly in terms of infrastructure but would represent a sound investment in an area of the country vital to national interests.

BIOGRAPHICAL SKETCH

Wing Commander Jonathan Hamwood was assigned to intelligence duties in Canberra for three years prior to completing the RAAF Staff College in 1985. He was subsequently selected to command the Base Squadron at Point Cook, and followed that assignment as the first Commanding Officer of Base Squadron at the new base at Tindal in the Northern Territory. During that period he developed an appreciation for operating conditions in the north of Australia. Wing Commander Hamwood is a graduate of the Air War College class of 1990.

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CHAPTER I

DEFENCE POLICY FORMULATION

When the British chose to establish a penal colony in the inhospitable Antipodes just two hundred years ago, little did they envision the geostrategic advantages this island continent would eventually enjoy. The sentence of transportation to the burgeoning convict settlements in Australia was a punishment made all the more difficult to endure by virtue of the absolute remoteness of the colony from recognised civilisation. Yet this remoteness now serves as a natural barrier which insulates the nation from those who would wish it harm. Recognition of this fact in terms of strategic thinking was slow to eventuate this century, due to traditional ties to Britain and the Commonwealth and the general perception that Australian forces would be used in conjunction with allied forces in theatres overseas. As this chapter will disclose, defence policy in Australia has evolved to a stage where it reflects the maturity of a progressive and independent country prepared to shoulder responsibility towards maintaining and promoting security in its region of the world.

The Evolutionary Process

The Australian doctrine of collective security and forward defence in the 1950's mellowed in the post-Vietnam era in response to a definite shift in international attitudes. Britain had withdrawn its forces from Malaysia and Singapore, and the enunciation of the 'Guam Doctrine' by President Nixon in 1969 to limit the involvement of US military personnel in support of allied conflicts, forced countries like Australia to shoulder greater responsibility for defence in their region. The concern that countries in South East Asia would fall like dominoes in the wake of communist expansion gradually decreased, and a transition towards a more independent strategic outlook occurred.

Identifying a need for a consolidated study of Australian defence interests and objectives in the mid-1980's, the Government commissioned a Review of Australia's Defence Capabilities by one man, Mr Paul Dibb. The outcome was a detailed and profound insight into the Australian defence scene which, among other things, sought changes to the military strategy previously adopted by the country. The review itself contained no surprises, and was a valuable method of independently establishing a course for the three services to follow. Most of its recommendations were endorsed by the government in the form of a White Paper entitled '<u>The Defence of Australia - 1987</u>'. This

authoritative document gained wide acceptance throughout the defence community and has become the basis for defence planning beyond the 1990's.

The essential feature of the White Paper is the formal adoption of the goal of self-reliance in defence. Although this policy is viewed within a framework of alliances and arrangements with other countries, it does set Australia on a course of defence maturity which was well overdue. As a highly commendable goal, self-reliance engenders an attitude which pervades all levels of defence planning and equipment procurement, and should lead to a defence force more capable of sustained operations within its area of direct military interest (ADMI).

That self-reliance ought to be the country's goal is unquestioned; but what it calls for is a national commitment to an ideal which demands a substantial price over an extended period. As the White Paper points out:

> Self reliance as a goal is based on a realistic assessment of our strengths, as well as on a rigorous appraisal of our weaknesses and deficiencies. It draws on the skilful mobilisation of Australia's resources - physical, financial and human.(1)

The rate at which self-reliance proceeds will be dictated by economic circumstances, and bipartisan support in Parliament is necessary for such a crucial policy to endure. Although blessed with unique natural defensive

barriers, this country has a daunting task if it is to truly provide defence in depth of this vast continent on the basis of self- reliance.

Central to the theme of defence in depth is a strategy which combines complementing strata of defensive and offensive capability throughout Australia's zone of military interest. The first layer consists of the on-going task of collecting and evaluating intelligence to monitor regional developments so that adequate warning of possible threats is obtained. To threaten the nation militarily, a regional adversary would have to enter the expansive sea and air gap that surrounds the country; therefore, in subsequent stages the Australian Defence Force (ADF) seeks to develop a comprehensive range of capabilities, initially to detect and then confront an aggressor in a timely fashion in that gap. Land warfare elements with airpower support comprise the final link in the defensive chain and would be capable of responding rapidly to counter penetrating enemy forces across the north of the country.

Despite alliances and agreements with other nations, the initial thrust by a hostile force towards Australia will have to be dealt with *solely* by the ADF. At no stage is external military assistance to the ADF guaranteed except with respect to the provision of military materiel and intelligence. The taxpayers of Australia expect its defence force to be able to protect them; and the precepts outlined

in the 1987 White Paper offer a comprehensive guide for that to occur.

Australia's defence posture forms an integral part of the nation's regional security outlook, and in the past decade the Royal Australian Air Force (RAAF) has taken major steps to ensure that air power will be available when and where it is needed. Although the Service is thoroughly capable and confident of operating in a variety of conditions, the shift in emphasis to operating in our northern environs places demands that relatively few Australians have experienced. To be equal to the task the RAAF needs to familiarise itself with the problems that can beset a combat force in that remote section of the country.

Northern Relevance

Australia's strategic disposition is moulded in large part by its location in the southern hemisphere, its size and geography, its relatively small population, the uneven distribution of that population throughout the continent, and the location of its limited industrial base. This island nation is surrounded on three sides by thousands of kilometres of open ocean; however, within hundreds of kilometres to the north, the Indonesian archipelago and Papua New Guinea stretch across the top of Australia. Beyond this chain lies an array of South East Asian nations whose history is interspersed with periods of conflict.

Were it not for some quirk of nature in the past that distinguished Australia from its northern neighbours, it would also have been considered part of Asia.

In the context of self-reliance and with due regard to the proximity of neighbours to the north, much greater emphasis has been placed on the defence of northern Australia in recent years. Paul Dibb focussed attention on an apparent misalignment of ADF posture in his review:

> If we are to project credible military power in the most vulnerable part of the continent, we require a larger permanent presence in the north of Australia.(2)

The 1987 White Paper complemented Dibb's assertion in its assessment of the strategic situation with regard to the physical environment by stating:

> These basic facts of our geographic location indicate that conventional military attack against Australia would most likely be directed against the northern part of the mainland, its maritime approaches or off-shore territories.(3)

Only once in its two-hundred-year history has Australia been threatened militarily by another power. During 1942 it suffered a series of attacks by Japanese aircraft along the northern and northwestern coastlines, calculated by many as the precursor to a full-scale invasion. Japanese military planners had indeed considered Australia as a target for occupation, but diverted their attention towards other Pacific interests. The lesson

learned from this gruelling experience was overshadowed by subsequent events in New Guinea, and Australians breathed a collective sigh of relief when the Japanese were eventually repelled. Several decades later, the conclusion that units of the ADF need to be permanently based in the remote regions of the far north to provide essential layers of defence is being addressed.

Alliances

Australia's alliance with the United States has been the cornerstone of defence policy since the dark days of 1942 when the security of the nation was threatened as never before. The might of the US forces combined with our own kept the Japanese onslaught at bay during a period when our traditional allies were fully committed in other theatres of war. For the first time the nation's vulnerability to a regional aggressor was recognised, and the debt owed to the US for its assistance in time of need was gratefully acknowledged. That debt has continued to be honoured through support for US policy and military action in the Asian region, and the bond between the two countries continues to grow.

As the champion of democracy and undisputed leader of the free world, the US accepts a responsibility for helping to maintain the security of many regions in support of several friendly countries and allies. Australia's obligation towards the US alliance is affirmed in the ANZUS

treaty, which represents a 'security blanket' of inestimable value. However, the treaty is not a one-way arrangement, and Australia has to be prepared to shoulder its share of the burden of the defence of Western interests. Not only must Australia be largely capable of defending itself, but it must also be able to respond to the contingency of a conflict within the Asia-Pacific region.

Fringe elements within Australian society and politics decry the special relationship maintained with the US and claim the price of admission to this select club places the country at greater risk than it would otherwise be. Nevertheless, the high level of cooperation with the US, in itself, establishes a deterrent effect, and the privileges accruing from the partnership are considerable. Access to high levels of defence technology and information, acquisition of state-of-the-art equipment, and a guaranteed supply of munitions in time of conflict enable Australia to adopt a credible defence posture within the limitations of the country's economic resources. One has to look no further than New Zealand to appreciate some of the long-term difficulties that could beset a country which chooses isolation over cooperation.

Defence Posture

Australia's strategy of denial resulting from the layered framework of defence components should produce a deterrent effect on most aggressors. However, an

excessively potent force posture may have a negative effect if regional neighbours perceive the defensive network as muscle-flexing on a scale beyond reasonable requirements. Critics within Australia already consider the acquisition program being embarked upon as presenting an aggressive posture towards our neighbours. The transition in strategic outlook from one of dependence to one of self-reliance is the crucial factor which must not be overlooked if the country's ambitions are to be fully understood.

To be able to defend the nation's interests in an area encompassing about 10 percent of the earth's surface, the ADF needs to be structured differently from that of past decades. Not only do the citizens of Australia need to be made aware of this rationale, but neighbours in the Association of South East Asian Nations (ASEAN) to the north must also understand this relatively recent shift in policy. The defence hierarchy in Indonesia has already been briefed personally by the Australian Minister of Defence, and its concurrence has been indicated. In a different but pertinent context, the former Indonesian Commander-in-Chief and current Defence Minister Benny Moerdani said in an early 1989 interview:

> It is very legitimate for any country to build up its armed forces for the defence of its national interests. (4)

In essence, the ADF is being structured primarily on the basis of a defensive posture, with a capability to

conduct offensive operations if attacked. Many weapon systems presently in use and in the pipeline employ the latest technology and have the capacity to be used both defensively and offensively. Given Australia's economic and geographic situation, each weapon system procured is considered for use in a variety of roles to derive maximum utility from it.

Some confusion may arise in the mind of an observer as to the likely tactical employment of such systems, and ever it should be thus. Therefore, to avoid a misinterpretation of the country's defence posture, it is the responsibility of the Government to clarify publicly its intentions. In September 1989 the Minister for Defence reaffirmed the previously stated policy in a lecture in Sydney when he declared:

> ... *our strategy is, in the broadest possible sense,* defensive, but that does not preclude the use of offensive tactics to achieve a defensive goal. (5)

Purpose of This Paper

The Australian Government's defence policy has been formulated through a process involving interested parties and has been succinctly stated. The ADF has a clear perception of the direction in which it is headed, and widespread support is evident within the defence community. One of the implications for the ADF is a northward movement of its centre of gravity. Within this context, the present

paper will analyse RAAF air operations in the northern environment and suggest methods for optimal application of the force under those conditions. For the purpos of this study, the northern region of Australia is defined as the mainland and island territories north of the Tropic of Capricorn.

What follows is, first, a description of some of the unique difficulties likely to be encountered in the north, to set the scene with regard to the climate, infrastructure and other naturally-imposed constraints. The perspective will then alter outward to the nations in the Asian region which have either the capability, the history or the potential motive to become an adversary and threaten Australian sovereignty. The application of current doctrine to northern operations will then focus attention on how well airpower theory is being translated into practice. This discussion will be followed by a study of air operations and their sustainment in the northern setting. Methodical treatment of these aspects of the subject will provide a basis for suggestions as to the more effective use of air assets and personnel in the north of Australia.

CHAPTER II

THE NORTHERN ENVIRONMENT

To fully appreciate the ramifications of conducting military operations in the north, a clear understanding of the impediments inflicted by nature is necessary. This chapter will describe the backdrop formed by those elements, and the consequences for a country with a limited population whose inhabitants are generally attracted to more congenial surroundings in other parts of the continent.

Rigors of the North

Except for the strip of land east of and including the Great Dividing Range, northern Australia is characterised by mainly barren and inhospitable terrain. The east coast is so different geographically from the remainder of northern Australia that it requires separate description.

A flat and generally wide plain extends along the entire coast from Cape York across the north to the western extremities of the region near North West Cape. Only three elevated zones interrupt this stretch of monotonous coastal territory - the Arnhem Land plateau in the central north, the Kimberley Plateau in the northwest, and the Hammersley Ranges in the west. The soil over most of the region lacks

fertility, and a rocky, rough surface predominates in large tracts of Western Australia.

In contrast, the eastern coastline of Queensland is paralleled by a continuous mountainous range which forms a backdrop for a fertile and productive plain. Rain forests and jungles are common features along this coastal strip.

Two distinct seasons prevail in the north. These are commonly referred to as the "wet" and the "dry," with the tropical monsoon producing heavy rain throughout the extended summer period. Although the deep inland areas receive little rainfall, heavy precipitation is common in the "wet" up to hundreds of kilometres inland.

The high temperatures so characteristic of summer combined with the high humidity make the north an uncomfortable zone in which to operate. Strenuous activity throughout the daylight period is difficult to sustain, and little relief is gained from the humidity at night.

At RAAF Tindal in the central far north, the average temperatures during November at the beginning of the "wet" are a maximum of 37.9 degrees Celsius and a minimum of 24.8 degrees Celsius. Average relative humidity at 0900 hours during this period is 88 percent. (6) The November pattern is indicative of the climate experienced throughout a large portion of the far north until April, which heralds the "dry". Coastal areas such as Darwin experience slightly

lower daytime temperatures, but higher humidity accompanies the cooling sea breezes. The average temperatures in July at Tindal during the cooler season range from 13.1 to 29.8 degrees Celsius, with a considerably lower relative humidity. (7)

Although the "dry" is a much more comfortable season in which to operate, Army Reservists from the southern states reportedly suffered from heat stress at RAAF Curtin whilst participating in Exercise Kangaroo 89 (K89) during the less oppressive weather of the "dry."(8) Consequently, acclimatisation of personnel from southern states becomes an additional factor to be considered if high levels of work rate are expected upon arrival in the north. Fully acclimatised Hornet and F-111 aircrew whose aircraft are exposed to direct sunlight in the hotter months can expect to experience a degree of dehydration before a daytime sortie. This phenomenon occurs despite the relatively short time spent on the ground in open sunlight prior to takeoff, and may ultimately impinge on combat effectiveness. (8)

In addition, the effect of high daily temperatures on sensitive equipment in exposed aircraft may cause some deterioration over time. Consideration should be given to sheltering all high-performance aircraft from the harsh northern climate to reduce the adverse affects of heat and humidity.

Civilian Infrastructure

The climate experienced in much of northern Australia has had a detrimental effect on population growth throughout the region. An overwhelming majority of people dwell in the temperate coastal fringes south of the Tropic of Capricorn and display little desire to settle in the hot and relatively isolated north, apart from the Queensland coast. The most northern city in the country is Darwin, which was established essentially as a communications link to the rest of the world last century. With a population in the vicinity of 80,000, it is the only centre of significant size in the northern region west of the Queensland coast. In this vast but sparsely populated zone, infrastructure growth has been confined to those areas of economic viability.

Although the cattle industry was responsible initially for the limited development of the north, mining has overtaken it as the prime catalyst for investment in the region. Major mineral deposits of iron ore, bauxite, manganese, copper, gold, coal, diamonds and uranium have created a gradual expansion and upgrading of infrastructure. Roads, airports, seaports and even small townships have been constructed in the wake of mining industry progress. The huge offshore oil and gas project on the northwest shelf has had a similar impact on its immediate area, and the

development of offshore oil deposits in the Timor Sea, between Australia and Indonesia, promises further benefits.

This gradual but continuing expansion in the north attracts a range of communication services to isolated areas, made feasible by satellites and extension of the optical fibre telephone network. Yet as this vast region assumes greater economic and strategic importance to the nation, its paucity of inhabitants and consequent meagre representation in the Federal Parliament lead to an attitude of benign disinterest by Canberra bordering on neglect. A case in point is the long-awaited Alice Springs - Darwin railway line. Although possibly not viable on economic grounds, this would provide the north with a great boost to its strategic transport, to say nothing of the morale of the "Top Enders." Nevertheless, the resource-limited Northern Territory Government remains committed to its construction, with or without Federal Government assistance.

Road transport is firmly established as the most cost- effective method of delivery of materiel from southern states. Completion of the fully sealed Stuart Highway between Darwin and Adelaide has resulted in a reliable all-weather link for the majority of supplies to the far north. The main road westwards from the Stuart Highway across the north is generally single lane, and although sealed, is susceptible to flooding. Distances between fuel-dispensing sites are frequently measured in hundreds of kilometres.

Long-distance travel in the "wet" throughout most of the region is sometimes restricted to just two roads - the Stuart Highway and the road linking Learmonth in the west with Townsville in the east over a distance of several thousand kilometres.

The strategic immaturity of the surface transport network in the north highlights the fragile nature of the resupply routes. This may have to be offset by pre-positioning of stores at secure bases.

Queensland is the only state in the north to have an extensive rail network, with lines terminating at Cairns in the north and Mount Isa in the west. Most of the mineral products obtained in the region are transported to the nearest port by road or rail and then shipped to their destination. Supply of imported products such as petroleum from Singapore generally takes place in the reverse order, highlighting the importance of secure sea lines of communication (SLOCs) to the economic well-being of the region.

The extreme distances encountered by pastoralists in the north and the unreliability of many of the roads in the "wet," have resulted in a preponderance of general aviation aircraft throughout the region. These range from executive jets to small helicopters used for mustering cattle. Whilst many short and weather-limited private airfields exist as well as the enduring wartime strips, few non-military

controlled runways across the top of the country can cope with the combat demands of military aircraft. As a consequence, familiarity with the strips that *are* usable by RAAF aircraft is essential if maximum advantage is to be gained from operating on home soil. Pre-positioning of fuel at selected private strips by mutually beneficial arrangements with the owners would ensure even greater flexibility.

Air Force Infrastructure

For many years after World War II, the RAAF operational presence in the north of Australia consisted of bases at Townsville and Darwin, and only in the 1980s was a fighter squadron permanently deployed to the region. The RAAF's enlightened policy of instituting bare bases at Learmonth and Tindal in the late 1960s presaged the concept of a series of manned and unmanned bases across the north from Learmonth to Townsville. The decision to establish Tindal as the permanent base for a Hornet squadron and to construct a bare base facility at Derby South (RAAF Curtin) heralded a renewed commitment to bolstering northern defences, as subsequently portrayed in the White Paper. Plans are now in train to construct another bare base airfield near Weipa on Cape York Peninsula - an isolated but strategically important location.

The decision to build a completely new base around the airstrip at Tindal allowed designers to incorporate

ideas into the plan which had not been possible at other established bases. Already protected from any potential aggressor by being up to 300 kilometres from the coast, the base features a strong element of passive defence in its basic design. All buildings in the working zones are spaced well apart to minimise collective damage from air attack, and allow sufficient room for protective earthwalls to be bulldozed around them. Aircraft are parked in widely-separated shelters, whose dispersal mitigates against mutual destruction from explosion and which screen both aircraft and personnel from the harsh effects of the weather. Security of access by personnel is well planned for. When completed the weapon storage/preparation areas and emergency runways will comply with NATO standards.

Underground construction of vital installations is an expensive process, and in the case of northern bases it appears to have been ruled out because of budgetary expediency. Hardening of facilities is a cheaper option for providing passive defence and can be delayed until the financial situation is more favourable.

Whilst aircraft shelters can more appropriately be hardened, certain buildings which become prime targets in a conflict would be much more secure underground. Fuel, armament and liquid oxygen storage areas and command centres are examples of sites the loss of which could have a dramatic impact on combat effectiveness.

With Stage 1 of construction of both Tindal and Curtin now complete, lessons learned prior to and during K89 need to be incorporated into the plans for further stages and also to the bare base near Weipa. The general concept of operating bare bases may also need some refinement. Consideration needs to be given to increasing the number of support personnel permanently located at these isolated airfields. Whilst the small number taking care of Curtin and Learmonth are cross-trained to cope with a variety of exigencies, their ability to react to short-notice arrivals is extremely limited. This lack of flexibility creates a degree of reluctance within flying squadrons to plan sorties through these bases, with the result that general familiarity with them is often limited to major exercises. Employment of local reservists, including members of the Army Reserve, at these bases may be a cost-effective solution, and an increased permanent RAAF presence would have a positive impact on morale.

Operating Conditions

Units operating from northern bases quickly realise they are situated at the end of a long supply chain - not only in relation to distance but also time. With comparatively light demand from the civilian populace in the north for large quantities of goods, the resupply network is not geared to respond to a rapid surge in demand. For example, if the flow of fuel from Singapore were to be

disrupted at a time when a high rate of flying effort was called for from Tindal, Darwin and Curtin, great difficulty would be experienced transporting sufficient quantities of it from the south. A constant stream of fuel tankers would need to be diverted from southern cities to satisfy combat requirements of military aircraft. Response from this alternative source may not be swift, and the limited number of routes only exacerbates the problems likely to be encountered on these vulnerable and elongated arteries.

Secure, dispersed and adequate quantities of fuel need to be in place at all airfields from which operations are likely to be conducted. In addition, storage capabilities of alternate civil airfields to which combat aircraft may have to withdraw in the event of a base's becoming unusable should be studied. Facilities at Cairns, Mount Isa, Tennant Creek, Kununurra, Derby and Karratha may be inadequate for regular military use but form a valuable second string of airfields across the north from which some operations could be conducted. Although the strip at Gove is well located strategically, its usefulness is downgraded by its lack of access by an all-weather road. Consideration should also be given to aviation fuel resupply via the Northern Territory gas line, which may be able to sustain Tindal and Darwin in an emergency.

The limitations imposed on personnel by the severe climate, alluded to previously, can have a significant

impact on the efficiency of both aircrew and support members. Air conditioning has done much to alleviate the adverse effects of heat and humidity in the "wet", but its availability cannot be guaranteed in all situations. Another environmental problem occurring in the "dry" stems from the prevalence of dust particles of the thoroughly leached red dirt which penetrates everything through the medium of 'willy willys' or small whirlwinds. Aircraft maintenance in forward bases then becomes a difficult proposition, adding weight to the argument for some form of individual shelter for each aircraft.

Whilst the arduous conditions experienced in the remote north pose problems for defence planners, every effort should be made to turn these difficulties to advantage against an aggressor. The 'tyranny of distance' from which the zone suffers becomes magnified for an invader who initially has to cross the surrounding sea and air gap. Though the area contains vast mineral and petroleum wealth, the general sparseness of population and infrastructure diminishes the number of vital assets to be defended. However, a forced withdrawal from the Darwin/Tindal region would have a major detrimental effect on our ability to counterattack because of its relative isolation from other bases.

Many of the factors described in this chapter have the potential to hinder operations in the north and may not

be fully appreciated by key personnel in southern states. By recognising the adversity of the situation and striving to condition operational planning accordingly, the RAAF may be able to gauge more accurately its preparedness for combat in this region.

CHAPTER III

REGIONAL RELATIONS AND POTENTIAL THREATS

In order to establish the basis on which to structure air power in northern Australia, an assessment is needed of countries in the immediate region to determine whether they are likely to remain friendly or constitute a potential threat in the event of strained relations. History has shown that most international conflicts originate over disputes between neighbouring countries. This chapter will review the state of Australia's affiliation with certain Asian countries in its vicinity, and in some instances gauge the extent of their capability and intent to inflict harm upon us.

Developments Within ASEAN

Our neighbours in South East Asia, whilst never threatening Australia, have experienced almost continuous periods of turmoil since Japan went on the warpath in 1941. After World War II, communist movements in Indonesia, Malaya, Borneo and Vietnam were at the centre of conflicts at various times in each of those countries, and excepting Indonesia, external forces became involved in each of these internal struggles with varying degrees of success. Even

today, the leadership of Cambodia and the Phillipines is being contested by diverse forces within those countries. Whilst cause for concern, the turbulent nature of the region itself poses little threat to Australia.

The acquisition of sophisticated aircraft by countries in ASEAN continues in the context of efforts to modernise and upgrade capabilities. Malaysia has purchased Tornado fighter-bombers, Singapore has four E-2C early-warning aircraft, and Thailand, Indonesia and Singapore are each acquiring F-16s. Indonesia is also equipping its four new frigates with Harpoon missiles. (10)

Gareth Evans, the Australian Minister for Foreign Affairs recently offered the following reaction:

> None of this represents, however, a situation in which any ASEAN country has the capability, let alone the intention, to project and sustain major military action against Australia. (11)

Defence relations with two ASEAN countries, Malaysia and Singapore, remain strong through the Five Power Defence Agreement (FPDA) despite the withdrawal of two operational fighter squadrons from Butterworth Air Base to Australia. As Defence Minister Beazley explained:

> Malaysia and Singapore call the shots. In FPDA, we do what they want us to do. In Australia's case, for example, they have sought from us a continued presence in their area after our redeployment from Butterworth, and we have responded. (12)

Defence cooperation with *all* of the ASEAN countries should be the desired aim, in order to instill a greater

sense of "regional resilience" and allay any fears that Australia's concept of self-reliance is too introspective. Such cooperation could manifest itself in an exchange of surveillance information and an increase in combined exercises, training and conferences. Mutual empathy for each other's national interests would ensue, and any misunderstandings over territory or sovereignty could be defused more readily. At a time when improving East-West relations could reduce the superpower presence in South East Asia, the countries of the region should be prepared to increase cooperation and assume shared responsibility for mutual security.

Sources of Possible Confrontation

As a result of the comparatively short distances involved, Australians living in the north are much more aware of Asia than their southern counterparts are, and they actively pursue business interests and promote tourism throughout the Orient. Despite geographical proximity and the shared experience of previous colonial rule, however, there has not been a solid basis for development of those genuinely close ties that stem from common cultural, sporting and religious links. Fundamental differences exist between Australians, with their predominantly European background, and their Asian neighbours; and relations with some Asian countries have occasionally become strained because of these differences.

Indonesia

Indonesia is an example of a society with which many Australians are unfamiliar and may not feel entirely comfortable. Contrasts between the two countries are much more pronounced than similarities. Indonesia's 175 million people make it the fifth most populous nation in the world, more than 10 times the size of Australia.(13) It possesses the largest active armed forces within ASEAN, but its military expenditures are only one-third of Australia's.(14) Its politics and armed forces are closely intertwined, with the president, vice president and almost one-third of the Cabinet having military backgrounds.(15) Such involvement in politics by the military is alien to the Australian experience.

Yet the Indonesian archipelago lies across important air and sea routes to Europe and the North Pacific, so stability in that area becomes a strategic imperative for Australia. The Australian Government assessment is that any military threat to Australia will almost certainly come from or through this barrier to our north.(15)

Some of the activities of the Indonesian Government in the past have also left a bitter taste for many Australians. Foremost among these is the forced military occupation in the mid-1970s of East Timor, only a few hundred kilometres to the north west of Darwin. The deaths

of a handful of Australian journalists covering events in Timor created a furore at home, especially within news media circles. The strained relationship between the Australian free press and the Indonesian Government was exacerbated when an Australian journalist's credentials were withdrawn following criticism of President Suharto. Small scale disputes along the ill-defined border of Irian Jaya and Papua New Guinea during the 1980s have also been viewed dubiously by Australians, who have feared a deterioration of the situation could ultimately involve larger military forces.

Fortunately, greater rapport has been established between the two countries at both the government and military levels since early 1989. In addition, the strengthened economic linkage that the proposed agreement on joint exploitation of the oil and gas resources in the Timor Gap would bring about augers well for future bilateral relations. As Australia's Minister for Foreign Affairs recently stated:

> The Timor Gap resolution is a clear example of a non-military solution to a problem that historically has often led to conflict - a disputed boundary involving the fate of prized resources. (17)

Indonesia has relied on oil for much of its foreign exchange earnings and tax revenue, but with domestic demand expanding, it faces the prospect of becoming a net *importer* of oil by early next century unless new reserves are found. (18) Consequently, the Timor Gap agreement assumes not only

economic importance but also performs a bonding function between the two powers which has positive implications for regional security.

India

From the point of view of defending against an aggressor in the northern approaches to Australia, consideration has to be given to powerful forces beyond the South East Asian region. One of the closest and most potent is India, whose increasing power projection capabilities have not gone unnoticed by countries in the Indian Ocean littoral. The official Australian assessment is that:

> By the early 1990s the Indian Navy... will become increasingly capable of projecting power as far south as Southern Africa and Western Australia, but the Navy's restricted fleet support capability would limit its capacity to sustain an operation in the Southern Indian Ocean.(19)

On the other hand, sustaining an operation in the *eastern* Indian Ocean should be well within its capabilities.

As a nation headed for superpower status by the early 21st century, India seems intent on gaining recognition of its military might as a precursor to achieving other symbols of international prestige. Although it has been preoccupied in the past with traditional rivals, China and Pakistan, its increasing strategic reach will allow it to show greater interest in South East Asia and the South Pacific. Indians, who comprise almost 50 per cent of the Fijian population, evoked a large degree of sympathy from mother India when

they became the subject of discrimination by Fiji's laws. Were India to flex its military muscle in such a context, Australia might find itself drawn into a regional imbroglio.

Other Asian Countries

Although two other Asian powers, China and Japan, maintain sizeable military forces, neither has the capacity to carry on substantial military activity within Australia's area of direct military interest. Only the United States and the USSR have the range of naval, air and logistic capabilities needed to project and sustain conventional forces to intimidate our island continent.(20)

Security Assessment

Currently, however, Australia enjoys a relatively benign threat environment, with no natural enemy and cordial relations with most countries in the South East Asian and South Pacific regions. Internal strife in Cambodia and to a lesser degree the Phillipines are the only sources of simmering discontent that might invite Australian military participation. In either circumstance, multinational involvement is likely, and Australia would be only part of a balanced and appropriate contribution to help solve the problem.

Towards what threat, then, should the RAAF prepare in its northern Australian posture. If threat is gauged

simplistically as hostile intent plus capability, Australia's good fortune becomes the defence planner's dilemma.

Even though no obvious menace to national security exists, the nature of the beast is such that it is often unpredictable. Nowadays, with so much depending on a nation's economy to provide the quality of life its people seek, great potential exists for a nation to resolve a threat to its economic interests militarily. Across the north of Australia the sovereignty of offshore assets-- namely, oil and gas fields and fishing zones-- is the most likely source of contention with a neighbour, followed closely by uncontrolled population flows.

The task of monitoring traffic in Australian territorial waters is shared currently by a combination of military and civilian agencies, and is geared mainly towards intercepting non-military intruders. If a danger to our national interests were to be triggered in this region, regardless of its genesis it could develop to eventually take the form of a combined air and naval force, intent initially on attacking our military bases and weapon systems in the north. Not only should Australia concentrate on detecting and intercepting intruders as far from the coast as possible, but it should also take steps to protect its northern military assets from preemptive attack.

Additionally, relations with neighbouring countries should not be viewed in the context of parliamentary terms or five year defence programs, but with due cognisance of the fact that a neighbour's presence remains unalterable, and despite the best of intentions differences may result in antagonism. A steady and unremarkable bolstering of our northern defences without appearing aggressive can only benefit the long-term protection of Australia's national interests.

CHAPTER IV

AIR POWER CONSIDERATIONS

Discussion of current defence policy, the unique operating environment of northern Australia, and the potential dangers that confront the country has set the stage for this chapter to explore the RAAF doctrinal precepts that guide the application of air power throughout the north. At the outset, the point must be made that although air power is an integral component of the total force it is studied separately here because of its extraordinary characteristics. Its application is described under the following hierarchy of campaigns laid out in the RAAF Air Power Doctrine Manual :

- Control of the Air
- Strategic Strike
- Support for Combat Forces.(21)

Higher-Level Command Arrangements

For these overarching missions to be carried out simultaneously, command of resources must be vested in a single authority at the highest practical level. Although total cooperation and coordination with the other services is of paramount importance in the ADF, each service operating expertly within its own separate realm requires a single point of professional command.

This centralised command combined with decentralised control of assets guarantees the flexibility necessary to operate a small force effectively. Only when the joint force commanders are competing for control of assets should the Commander of the Defence Force (CDF) determine the outcome, usually after advice from the Chiefs of Staff Committee. Without this discipline, the temptation to allocate resources as the need arises may result in the inability to concentrate sufficient firepower to strike the vital blow. Examples of such decentralised control of assets could be the allocation of some Hornets to the Maritime Commander, or an infantry unit to the Air Commander. The multi-role capabilities of our air assets demand the flexibility emanating from centralised command and decentralised control.

Control of the Air

The ubiquitous nature of air power makes it an attractive option for northern defence. No other force can patrol the vast distances inherent in this task and respond to an intruder so rapidly with concentrated firepower.

However, competition from all three services for the type of support only air power can provide may ultimately hinder the RAAF's efforts to achieve its primary combat objective - control of the air. This aim is widely accepted by exponents of air power as the vital first stage which

allows the other two campaigns to be waged successfully. Without control of the air, not only will sustained air combat be less effective, but other ADF operations may also be jeopardised.

Whilst the concept is readily understood and appreciated, control of the air is far from easily delivered. It may require the employment of the entire range of air and ground assets that comprise the National Air Defence and Airspace Control System (NADACS) initially in a defensive role, before committing our resources offensively. If an adversary approaches from the direction generally anticipated, much of the RAAF's combat airpower wou'd need to be deployed northwards from its home bases.

The more a northward mobilisation of the RAAF is contemplated, the more attractive the location of the base at Tindal becomes. From the points of view of vulnerability, defendability and accessibility to the region, the base is ideally situated as a permanent facility from which to conduct and control operations over much of northern Australia and the adjacent sea and air gap. Darwin, Townsville and the bare bases provide the necessary flexibility to deploy further forward but lack the geographical security for permanent command, control and communication (C3) infrastructure. The importance of air base security is a corollary of Air Marshal R. G. Funnell's assertion that:

> As a conflict develops your air power will need to gain control of the air, a task which is best achieved by destroying your opponent's air forces on the ground. (22)

We must assume that any aggressor has developed a similar strategy and has targeted our bases accordingly.

Strategic Strike

The second campaign - strategic strike - encompasses those purely offensive operations aimed directly at an enemy's military bases and supporting infrastructure which enable him to wage war. Whilst our defence policy is genuinely defensive, our forces must be prepared not just to oppose an antagonist, but to inflict sufficient destruction upon his military capabilities so that he loses the will to pursue his warlike intentions. This course of action is the most effective contribution air power can provide to the cessation of hostilities, and has the potential to encapsulate many of the principles of war proven to be so beneficial in past conflicts.

For the RAAF to carry out strategic strikes in the most productive manner, authorities at Federal Cabinet level must define clear and realistic objectives without unduly restrictive constraints. The lessons of US Executive vacillations in the application of strategic air strikes in Vietnam are well recorded. Broad Cabinet guidelines for such strikes need to be established as expediently as

possible so that their execution can conform to overall national strategy.

Our forward bases in the north are dispersed sufficiently to provide support facilities for strategic strike missions in a variety of exigencies. Even so, serious consideration should be given to greater use of Australian territorial islands-- namely, Cocos and Christmas-- in a similar vein. As unsinkable, stationary aircraft carriers, their use as bare bases would endow the RAAF with some of the attributes often sought by more expensive methods. Being situated further forward into our area of direct military interest than mainland airfields, they could serve as replenishment bases for aircraft on missions across a wide spectrum-- strike, interdiction, maritime patrol, combat air patrol (CAP) for fleet support and airborne early warning and control (AEW&C). Thus, they could also extend our intelligence gathering, airspace control and communication capabilities and serve as a tripwire, warning us of impending assault.

Mutually supportive as they are, these two islands together complicate an aggressor's plans and deny him unrestricted access to the area for his own use. By virtue of their obvious vulnerability, however, island bare bases do not convey aggressive tendencies to neighbouring countries. On the contrary, they could reinforce regional security if allies were also encouraged to use them.

Support for Combat Forces

The third campaign involves support for combat forces of the ADF, that is, joint operations with one or both of the other Australian services. The current Chief of Air Staff enunciated his beliefs on the use of air power in combination with the other services in the 1988 Blamey Oration, when he stated:

> Air power is not independent of other forms of combat power nor are air forces subordinate or supplementary to the older forms of warfare. All forms of warfare are complementary to each other and each service must interact with and be supportive of the others. That is the key to success in modern warfare.(23)

The national priority given to countering an opposing force in the approaches to our country dictates that air power, with all its inherent advantages, must be the prime player in this medium. As the nation's security can be seriously threatened only by a major invading force, control of the northern approaches to counter such an eventuality is the axiom upon which our strategy must be based.

Maritime Support

Of crucial importance to air and maritime commanders alike is a thorough understanding of the contribution air power can make across the vast reaches of the sea and air gap. So responsive, versatile, ubiquitous and lethal can air power be in this environment that it may become the dominant partner in Australian maritime strategy. Equipped

with missiles that alone can put modern naval surface ships out of action, three aircraft types in the RAAF inventory are capable of combatting regional naval forces at great distances from the mainland. In combination, these aircraft exhibit a variety of characteristics as to be able to address a range of credible maritime contingencies.

The difficulty lies in basing these scarce resources in appropriate locations and numbers to complement our naval forces. Again, the option of using Christmas and Cocos Islands as bases would increase the versatility already afforded by the network of RAAF establishments across the north. However, in order to prepare bare bases adequately for combat, *secure* storage for aircraft, fuel and weapons looms large as a basic requirement. Although provision of this infrastructure would not be inexpensive, the RAAF should resolve to accomplish this as part of a long-term plan.

Land Support

Given the anticipated order of events in an attack on Australian sovereignty, support for land forces against a major invading force should occur only after our strategy has failed either to detect or halt the invader's progress in the sea and air approaches. This support can generally be provided in two forms - airlift and offensive air operations in the vicinity of the battlefield.

Strategic mobility will take initial priority, and a variety of factors will impinge upon the types of aircraft used. With the limited number of northern airfields capable of handling jet transports, planning decisions will focus on destinations, speed of response and availability of aircraft. The distances involved in a northward mobilisation will necessitate major augmentation of the military transport fleet by civil aircraft, allowing more RAAF aircraft to be dedicated mainly to providing tactical mobility within the area of operations (AO).

Offensive air support for land operations is, in comparison, a much more complex issue, and questions surface about the most effective use of air power in this context. Although such support can take many forms, the overriding priority must be to gain control of the air. Only with a favourable air environment will a land commander be confident of carrying out his missions.

On the assumption that the initial objective of an amphibious or airborne invading force would be to establish a beachhead in the vicinity of readily usable port or airfield facilities, our next priority should be to interdict the enemy and his supply lines to prevent him from gaining control of elements of our northern infrastructure. Denying him the use of those facilities which have military utility will render his task more formidable and ours more straightforward.

The role that evokes the most controversy is close air support (CAIRS) of ground forces in contact with the enemy. Essentially, CAIRS serves the same purpose as ground artillery, but without its innate shortcomings related to range, manoeuvrability and concentration of firepower. However, employing sophisticated aircraft like the Hornet in such potentially dangerous situations may be a luxury the ADF can ill afford. Modern, man-portable surface-to-air missiles have tended to swing the balance of survivability in favour of ground forces possessing these lethal weapons. Given the limited number of operating bases for Hornets and F-111s in northern Australia, response times may also be unreasonable.

> Without reasonably permissive airspace within which to work, close air support may not be worth the risk to valuable aircraft that can be used in better ways.(24)

If the invading force were to become scattered, as is conceivable in the northern region, helicopter gunships may be a more appropriate platform for this role. Ultimately, the priority given to CAIRS needs to be viewed in relation to the most effective long-term use of the limited air assets available.

Summary

The three broad assignments of control of the air, strategic strike and support for combat forces are not separate tasks but form a continuum whose priorities depend

upon prevailing circumstances. With the dominance of air power in the arena of modern warfare, therefore, the military commander and his planners must study closely the full implications of its use. Overcoming the "tyranny of distance" in the north accentuates the advantages so characteristically obvious in air power. Even though each campaign may be conducted concurrently, unity of command of air power remains the underlying principle on which combat operations should be based.

CHAPTER V

AIR OPERATIONS

Having described the fundamental considerations that will govern the successful application of air power in northern Australia, this chapter will translate those axioms into actual operational terms. Whilst operating in the north is not a novel experience for most RAAF combat squadrons, the dynamism of the circumstances presents a constant learning challenge. The advent of new detection radars, the introduction of indigenous airborne refuelling, and the employment of modern fighter aircraft in a maritime environment exemplify situations which have yet to be fully mastered. Examination of each type of operation in its northern context will shed some light on whether air power is being used as effectively as possible at present.

Air Defence

In accordance with the emphasis on the defensive nature of the country's security posture, the RAAF is in the process of assembling the most potent air defence network in the region. The acquisition of the Hornet tactical fighter aircraft has greatly enhanced both offensive and defensive counterair capabilities of the RAAF and is the basis for dealing with all enemy air activities. This highly-capable aircraft which embodies most of the

features necessary in a multi-role fighter, is the focal point around which the NADACS is being developed. Its advanced radar, digital avionics and all-weather capabilities combined with relatively long-range prowess ensure the "business end" of the air defence system is equal to the task. The introduction of B-707 tankers in 1990 will greatly expand the operating perspective of the Hornets, but flexible command and control arrangements for these tanker/transport assets will need to be instituted if they are to retain a dual capability.

Another cornerstone of the system will be an indigenous version of over-the-horizon radar (OTHR) to provide early warning of approaching aircraft. The success thus far of the experimental and developmental project called "Jindalee" has persuaded the Australian government to proceed with the construction of three operational sites to provide complete coverage of the northern approaches.

As the first link in the air defence chain through its ability to detect aircraft and ships in our ADMI, OTHR essentially dictates the process to be employed in the succession of interrelated steps to intercept an invader. Although it can detect targets out to at least 3,000 kilometres from the radar site, it does not provide information on altitude or target identification. (25) Also, unpredictable position errors may prevent close control during interception. The degree to which these

limitations affect our response to an invader make the acquisition of AEW&C aircraft essential and have a direct bearing on the type of aircraft to be chosen.

Although early detection of inbound aircraft throughout the north is the main advantage of this system, interception in the near approaches remains an attractive option in order to curb an opponent's choices through reduced endurance, whilst maximising our own. In addition, OTHR assists in the management of our tactical level assets with regard to alert states of aircraft and aircrew.

Indications from K89 are that the experimental OTHR system is producing results much better than expected, particularly at dawn and dusk when rapid ionospheric changes usually degrade performance. (26) However, before definitive action can be taken to streamline our air defence system, more conclusive results on the fully operational OTHR network are required. In particular, the choice of an AEW&C aircraft should be made to complement the capabilities of both the OTHR and the aircraft it will direct.

Although the government is committed to acquiring AEW&C aircraft, a reasonably priced model suitable for Australia's needs is unavailable on the market at present. The original intention was to acquire four aircraft by the mid-1990s, but the Minister for Defence has told the RAAF that it may have to wait longer, until an appropriate system had been developed. (27) The basic parameters for these

platforms include a rapid reaction capability to become airborne, high dash speed for transit/evasion, sufficient endurance and appropriate crew rest facilities. With our OTHR not fully operational and no direct threat to the country, the lack of a sense of urgency in this matter is understandable - even prudent. Yet how is the gap to be filled in the interim?

The only platform in our current inventory that comes close to being able to substitute for an AEW&C aircraft is the Orion. Long-range maritime patrol (LRMP) aircraft have previously performed similar functions, but on an ad hoc basis without specific training beforehand. (28) Although insufficient Orion crews are available at present to dedicate to this role and the aircraft itself has only limited applicability, considerable benefit could be gained by the other elements of the NADACS from their involvement. The experience would not be lost on those aircrew diverted to this task either, as they could serve as the nucleus of a future AEW&C squadron.

Though the direction of expected threat will determine to which northern bases air defence resources are deployed, infrastructure requirements dictate that the location of the command centre for such operations be decided beforehand. With the complexity of communications required to centralise sensor information and subsequently control air assets, acquiring elaborate mobile command

centres for deployment as needed may not be a viable remedy. Nevertheless, some redundancy in the form of mobile control and reporting facilities would still be necessary.

Tindal presents itself as an attractive option from which to control air defence operations across the entire north of the country by virtue of its pivotal location and lack of vulnerability. Modern technology enables data from a variety of radars in dispersed sites, such as across the north, to be fed to a master plot so that real-time coverage of this vast area could be displayed at a central location such as Tindal. However, the air defence ground environment is totally dependent upon secure, reliable and redundant communications links. The transmission of data through satellite links is necessary for fixed installations, and equipment such as Link 11 and Link 4 is required for mobile platforms like AEW&C aircraft and fighters. At present, the RAAF is well short of achieving this standard of communications environment and must address these glaring deficiencies.

Until each component of the air defence system matures, the RAAF will be forced to operate with chinks in its armour; and as it evolves, close coordination will be required to ensure this unique network functions effectively as a secure system.

Strike Operations

Although well on the way towards establishing a secure air defence network, the RAAF must be able to strike back at an aggressor to ensure national survival and to enhance deterrence. Once under way, a conflict cannot be terminated on favourable terms without taking offensive action. Moreover, the invader who fears no retaliatory offensive response from his victim is at liberty to devote his entire force to the assault, and because he can choose the time, place and size of his attack, he already possesses many advantages. In order to wrest the initiative from him, we must retain the ability to strike at his vital points. Targeting his air force at its bases assumes a high priority because such a measure has the potential to reduce the amount of damage his forces can inflict on ours.

The triad of F-111, Hornet and Orion aircraft with their associated weapons comprise the full extent of RAAF offensive air power. In the South East Asian and South West Pacific regions, each one is without peer. However, their numbers are small, their assignments are diverse and losses in combat would severely affect our ability to sustain a high rate of effort. Consequently, strikes on the enemy heartland should be timely, highly concentrated and well coordinated if the usefulness of air power is to be fully exploited.

The enhancing effect of aerial refuelling offers the advantages of range, sustained high speed, and transit-route flexibility, all of which combine to generate uncertainty in the mind of an opponent. Although the Boeing 707 tanker conversion will permit the refuelling of airborne Hornets, the tanker's inability to refuel our prime strike aircraft, the F-111, needs to be addressed if self-reliance is to be achieved. In addition, any AEW&C platform acquired in the future should be capable of being refuelled aerially.

When completed, the network of RAAF bases in the north will offer a choice of airfields from which to launch strikes. This situation could be further optimised by upgrading Christmas and Cocos Islands to support such operations.

The ability of all three aircraft types in the strike triad to launch Harpoon anti-ship missiles creates a powerful deterrent for any invader planning a naval operation against Australia. However, coordination between ships, aircraft and ground-based sensors will need to be streamlined for them to be effective in this multi-dimensional threat environment. One of the weak links in the chain is the vulnerability of the defenceless Orion on its long-range missions. This may impose a burden on the Hornet fleet if the threat assessment justified such protection.

The employment of these assets in either the land or maritime-strike role necessitates synchronisation and control by an accompanying airborne platform with a clear picture of the scene of action. An understanding of this complex responsibility is vital to the selection of an appropriate vehicle for AEW&C.

Reconnaissance (29)

A prerequisite for the most effective use of our air power is prior knowledge of an enemy, without which many of the air power's inherent advantages can be lost. One of the ways in which this knowledge is gathered is by aerial reconnaissance-- a tedious and time consuming task in peacetime but one which can pay dividends in time of need.

Although intelligence is obtained from many sources, the airborne contribution by the RAAF is primarily from its Orions and, to a lesser degree, its RF-111s. Until some Hornets are equipped with a reconnaissance capability, photographic intelligence at the tactical level for ground forces will be extremely limited.

The current emphasis on monitoring the sea lanes in our area of direct military interest results from the country's dependence on seaborne trade. Any threat to our ability to continue such activity would constitute a danger to our national interests and might require use of military force. Threatening action could range from piracy to the

establishment of an exclusive maritime zone which severely hindered our trade route options. In the past, piracy in the South East Asian region has resulted in US military intervention. An exclusive maritime zone in that region could disrupt trade with our major trading partner-- Japan.

Surveillance of the vast ocean expanse of our northern approaches may be fulfilled in the near future by OTHR, allowing Orions to dedicate more time to anti-submarine reconnaissance. Airborne interception of suspicious surface craft could be undertaken by Orions or F-111s after initial detection by OTHR, thereby reducing the amount of unproductive surveillance. However, the decision to respond from home bases in the south or deploy a permanent detachment to northern bases will need to be balanced against the degree of potential threat. Regardless of the choice, infrastructure and logistic support for these aircraft in the north will have to become more attuned to their distinctive requirements.

Battlefield Operations

Were an enemy force to lodge on the mainland or island territories of Australia in large numbers, air power would be used in close conjunction with our land forces to repel them. In the main, this assistance would take two forms-- air interdiction, which involves all methods of harassing the enemy forces to limit their capacity to engage

ours, and close air support, when the firepower of the air is integrated with ground forces against the enemy.

The relationship between the two roles is close but not simple. Whilst the success of air interdiction may limit the need for CAIRS, interdicting the enemy's supply line may not be highly effective unless the enemy is expending supplies in engagements against our forces. On the modern battlefield, Clauswitz's "fog and friction" of war are particularly evident and demand from the air and ground forces alike a high standard of cooperation in both roles to achieve success.

Joint planning of missions is such an essential prerequisite that collocation of the headquarters of Army and RAAF operational units involved should be considered. In practice, this is difficult to achieve because of the land force's need to be in the vicinity of the battlefield, while the RAAF must rely on an appropriate airfield with relevant support facilities. This predicament is no more apparent than in the expanses of northern Australia. Notwithstanding these problems, every effort should be made to ensure liaison between the two services is very close and that each service has a thorough appreciation of the other's mission and capabilities.

Improvements in ground-based air defence systems have introduced a much more lethal environment for aircraft supporting land forces than was evident in the war in

Vietnam. Relatively cheap but highly mobile and sophisticated missiles have had a unhealthy impact on the superiority of air power over the battlefield, to which the Soviets in Afghanistan can attest. No longer can aircraft afford to make multiple low-level passes over a hostile target area. Thus, the benefits of each CAIRS mission will now have to be weighed against the likely costs.

Nevertheless, a range of modern weapon systems exists to increase the survivability of aircraft in this arena. Precision-guided munitions (PGMs) provide a stand-off capability to alleviate much of this perilous exposure, but they are expensive and not held in sufficient quantities for sustained operations. In the near future, the introduction of the Global Positioning System into the ADF should serve to eliminate navigational inaccuracies over the battlefield and improve coordinated action by the air and land forces.

A most vigorously debated subject is the employment of the RAAF's Hornets in the CAIRS role. Designed as a multi-role fighter, it has superb performance credentials, but some factors may mitigate against extensive use of Hornets in this role. The Hornet's extreme versatility is the very attribute that will lead to its application in a number of roles in an attempt to prevent a land force engagement from ever taking place. A senior member of the Rand Corporation concluded that:

> Close Air Support is becoming an increasingly imperilled mission in well-defended airspace. It will definitely not be an appropriate mission for expensive fighters like the F-18.(30)

The three operational Hornet squadrons would presumably suffer some attrition before land forces met, and an air commander may be reluctant to commit his remaining fighter and strike assets in a CAIRS role using only gravity bombs against an opponent armed with mobile SAMs. If this important role is to be adequately performed by the RAAF without a high rate of casualties, more PGMs should be procured, and aircraft should be fitted with infra-red and night-vision systems. Consideration should also be given to employing less sophisticated aircraft than Hornets and F-111s, armed with PGMs, in this role. The CDF expressed the view that:

> There is probably a case for a successor aircraft to the Macchi 326 ... to provide maritime and close air support in the less hostile air environment expected in some credible contingencies. (31)

With a replacement for the Macchi on the distant horizon, a conversion to enable some of them to perform a limited CAIRS role would be the model of improvisation - a laudable virtue in any military organisation.

Airlift

Given the present distribution of forces throughout Australia, a situation requiring an urgent response in the north would highlight a deficiency in the ability of the

RAAF to mobilise the ADF. The demands to airlift military supplies and certain personnel would likely overwhelm the Air Lift Group (ALG) if support from the civil sector were not readily forthcoming. Only a small proportion of the ADF is permanently stationed in the north, and the only rapid means to transport southern-based units across the distances concerned is by air. Typical distances from southern capital cities to the northern coast are on the order of 3,000+ kilometres. Even the Army's Operational Deployment Force based in the northern city of Townsville may require a great deal of airlift if its destination is far afield. Also, most operational RAAF squadrons depend on Hercules airlift for the accompanying support personnel and equipment needed to keep them flying out of northern bases.

With the possibility that most of the B707 fleet could be committed to tanker duties, much of the strategic transport responsibility could fall on the two Hercules squadrons. Yet these aircraft are better suited to the tactical transport role-- providing transport from the few airfields in the north capable of handling jet transport aircraft to the more remote airstrips. The obvious solution during a major mobilisation is to charter aircraft from the civil fleet for the majority of strategic transport duties.

Tactical mobility for land forces becomes essential against dispersed forces using harassing tactics, and air power provides the vital ingredient necessary for timely

movement across the distant reaches of the north. Road transport is of limited utility due to the long distances and effects of the weather on off-road operations during the "wet." Where the terrain is rugged and all-weather roads are scarce, the only means of support or withdrawal of deployed land forces could be by air.

The Army's Blackhawk helicopters provide superb mobility in the vicinity of the battlefield, and would be complemented by the RAAF's ageing Caribous and possibly HS-748s. However, prepositioning of fuel remains a constant problem-- especially for the Caribous, with their use of the increasingly uncommon AVGAS.

The Chief of Air Staff stressed in a 1988 address that:

> ...there will never be enough tactical air transport for all the tasks...(32)

In anticipating relentless demand for tactical air transport in a northern scenario, the RAAF would be well advised to plan for *both* Hercules squadrons to operate in the tactical mode and to tailor training accordingly.

Synopsis of Air Operations

The RAAF is gradually approaching the stage when its air power will have achieved the appropriate balance to counter most credible contingencies. The versatile Hornet is proving to be the mainstay of the force with its potent contribution to many of the roles, ably supported by the

more specialised combat platforms-- the F-111 and the Orion. In either a defensive or offensive situation, this triad should be capable of ensuring the security of the nation.

Nevertheless, deficiencies exist in our line-up which show little sign of being addressed. A policy needs to be adopted which will ensure missile availability for the triad to pursue their tasks confidently. Acquiring infra-red and night vision enhancement sensors for a variety of uses would also extend capabilities and improve survivability. The deliberate decision not to provide our tankers with the means to refuel the F-111 appears shortsighted. Although economic constraints will always impinge on the full operational effectiveness of the force, some goals should be pursued unswervingly.

The allocation of aircraft to CAIRS and airlift cause some concern in various scenarios and needs to be examined further, as does the need to control the electronic environment in warfare through the use of specifically designed aircraft. Thought could be given to putting at least a basic EW fitment in some HS-748s. These steps would represent minor additions to an air force which is already the most impressive in the region but has a formidable geographical responsibility.

CHAPTER VI

SUSTAINMENT OPERATIONS

A less visible but nonetheless indispensable factor in the effectiveness of RAAF air power is the conglomeration of ground support activities which sustain air combat operations. The vigour and capacity of these functions have a direct bearing on the success of the airborne missions. To achieve a perspective commensurate with the relationship of each function to the aircraft mission, these activities are addressed as either combat or support-oriented functions.

Combat-Oriented Sustenance

Intelligence

The gathering of strategic intelligence by Australian and allied agencies to warn us of danger signals in the region appears to be unspectacularly successful. What is less so is the dissemination of this information to the operational and tactical levels of our combat forces. To be able to plan and fight effectively, we need to have as much knowledge as possible about the enemy's order of battle, his operating procedures, his mindset and his vulnerabilities.

We also need to look at his options to attack our possible weaknesses so that we can counter them.

Whilst we perceive no threat to our country at present, a process by which our operating-level personnel closely study a potential adversary would reveal useful knowledge of benefit against *any* enemy. To initiate this process the ADF should investigate the feasibility of forming small intelligence briefing teams with the best military knowledge available on certain individual countries which could pose a future threat. Ideally, the members of these teams would be combat oriented and would have spent part of their military careers living in the country of their specialty.

The objective of these teams would be to prepare speculative military plans of each of those countries against Australia at the strategic, operational and tactical levels. The next step would be to brief ADF personnel at all relevant levels on their findings, so that operating methods could be adopted to counter realistic potential adversaries. If we are to address our shortcomings and genuinely prepare for conflict, this measure could prove a relatively cheap but highly pertinent step in the right direction.

Airfield Defence

Any northern airfield which directly supports combat operations must be protected so that the flying effort can continue unhindered. The threats range from air and ground attack through sabotage to civil disobedience. Standard base security procedures complemented by passive defence measures such as hardening, dispersal, camouflage, deception and concealment can be established in peacetime, and they may be sufficient to counter the hazards at the lower end of the spectrum. However, as the intensity of the potential threat grows, so does the complexity of the arrangements to counter it. The forces required to defend an airfield will vary depending on the level and probability of the threat, along with the location and layout of the base and its vital assets.

In general, airfield defence consists of two main layers, responsibility for which may rest with separate commanders. The inner layer, normally the responsibility of the local RAAF commander, will consist of all of the key points and assets within the base complex, and it should be defended by RAAF airfield defence guards (ADGs) and assigned Army personnel, to be supplemented by other RAAF ground staff when available as a reserve force. Estimates of the number required to meet the commitment would vary from an

infantry company (120 men) in a situation of tension, to a battalion (600 men) during conflict.(32)

The Army's commitment to the defence of numerous vital assets throughout the north may severely limit the manpower it can allocate to defence of this inner layer, so the RAAF ought to become more accustomed to dealing with this task from its own resources. The level of proficiency of RAAF ground personnel in the base combatant role is generally not high, with some exceptions, and needs to be addressed at both training unit and base levels to achieve a uniformly acceptable standard. The task of airfield defence lends itself to being carried out more readily by Reservists than by many in the permanent air force.

Responsibility for the defence of the surrounding outer layer rests with the local land force commander, out to a distance of about 5 kilometres to counter stand-off weapons such as SAMs and mortars. Ground-based air defence supplied by the Army would come under the control of the sector air defence commander, and it would probably consist of a Rapier battery and at least one air defence troop equipped with shoulder-fired low-level weapons.(33) The local land force commander is also responsible for the protection of certain vital civilian infrastructure such as power and water supply on which RAAF bases rely to function smoothly. Redundant systems, such as incorporated at

Tindal, to guard against absolute dependency on supply of such utilities are necessary to reduce base vulnerability.

In a separate but related task, Army engineers would normally be responsible for rapid runway repair at RAAF establishments throughout the north. The demise of an RAAF airfield construction capability in the early 1970s has resulted in total reliance on external agencies in this regard. Similar concerns exist about the disposal of unexploded ordnance. These activities should be exercised regularly to ascertain the extent of Army capability and to ensure such faith is justified.

Command, Control and Communications (C3)

The ability of commanders to direct their assigned forces in the remote corners of northern Australia will be determined in large part by the C3 arrangements instituted beforehand. Regardless of the priorities allocated to various aircraft roles, RAAF functional group commanders may experience a diversion of their force assets during conflict from Air Command to other Joint Force Commanders by the authority of either the CDF or the Commander Joint Forces Australia (CJFA). To husband the remaining resources more prudently and impose a more direct influence on their activities, some group commanders may desire to be located closer to the area of operations than their present headquarters allow. The advantages of such proximity are

numerous, and despite advances in communications this step alone would enhance the command process.

Given the dearth of C3 facilities throughout the north, consideration should be given to the design and manufacture of air-transportable cabins to accompany a group commander so that he could maintain appropriate C3 at any northern RAAF base. This would also entail preparation of selected sites at each location to provide the full range of utility and communication hookups.

Whilst these arrangements would satisfy immediate requirements and provide appropriate flexibility, permanent hardened shelters for C3 at selected northern bases to meet the needs of more than one group commander should be addressed. These shelters should supply the full range of DISCON communications, secure video conferencing and computerised aircraft status reports at RAAF installations supporting combat operations.

The quality of command and control and the transmission of critical information and data generally may hinge entirely on the ability of our communications network to link elements of all three Services across the expanses of our large continent and the adjacent sea and air gap.

Support-Oriented Sustenance

Logistics

The long logistics pipeline to northern bases was alluded to in Chapter II with reference to the resupply of fuel, armament, spares and food. At present, all of these items have to be transported thousands of kilometres, usually along roads which are vulnerable to a variety of adverse factors. The exception is on the eastern coast between Rockhampton and Cairns, where the population base and civilian infrastructure make these consumables more readily available. The need to provide fuel to various parts of the north during K89 was a glaring example of not being able to rely totally on local sources.

Nevertheless, self sufficiency will not come without cost. The construction of storage facilities for prepositioning at all northern RAAF bases, particularly for fuel and armament, should assume a high priority in the preparation of these establishments for sustained combat operations. Because of the crucial nature of continued supply of such items, storage facilities should be hardened, dispersed and made not easily discernible from other buildings. They should also be capable of accepting deliveries from the standard form of surface transport across most of the north-- the road train.

Servicing aircraft flying at a high rate of effort will also become a problem if spares and servicing equipment are not readily available at remote bases and maintenance only below intermediate level is possible. The location of most major aircraft maintenance facilities in the south may require an expansion of aircraft engineering and spares facilities at either Townsville or Tindal to cope with the anticipated demands of wartime. The ability to repair battle-damaged aircraft within a theatre of operations is a force enhancer which will allow increased sortie rates and optimal use of our limited aircraft resources.

Manpower Administration

The vital issue of providing appropriately trained personnel in sufficient quantities to vigorously apply each component of the force is the key to success in combat. How well our servicemen perform in the contingencies envisaged in northern Australia will depend on how thoroughly they are prepared to operate in conditions that are often harsh and unfamiliar.

In the face of continually evolving responsibilities, Government-imposed manpower ceilings have compelled the RAAF to make optimal use of each of its uniformed members to meet new and dynamic challenges. Although the issue of manpower shortages continues to be the subject of ongoing consideration, when viewed in the context of a credible

conflict situation in the north, certain ingredients require particular attention.

The single most limiting factor is the deficit of trained aircrew - the front-line practitioners of air power. This shortage demands consideration over all other personnel stringencies. The drain of experienced RAAF pilots to civil airlines, which is likely to continue into the forseeable future, has to be countered by imaginative steps to make flying in the RAAF Reserve such an attractive option that pilot skills can be retained for use not only in an emergency but in routine operations.

This is easier said than done, for it would require a new approach to reserve force management. If utilisation of the Air Force Reserve is to be completely effective, its members should be made to feel they are not treated as second class citizens but are trained and employed as realistically as permanent members. The additional cost of such a policy, together with an increased commitment from the reservists, would result in a higher state of defence readiness than is presently being achieved.

Aside from increasing the usefulness of the Reserves, greater flexibility may be gained from expanding the training base of certain categories within the permanent force. Two examples illustrate this approach. The first concerns ADGs and Air Force involvement in airfield defence. Airmen whose normal work revolves around an airfield could

easily be trained to function effectively as ADGs in a secondary role if certain situations arose and their duties permitted. During a conflict, firemen, security guards and motor transport drivers are just three musterings which may be more productively employed in defence of an airfield perimeter than in their primary duty, to which they could revert at short notice.

The second example lies at the other end of the professional spectrum and utilises the skills of an air traffic controller in the air defence setting. His training on modern radars already prepares him to feel confident in that environment, and he could be replaced by civilian controllers in his primary role if need be. The ability to supplement the role of the air intercept ground controller with RAAF air traffic controllers may pay dividends during periods of tension in the northern approaches. This capacity to improvise by cross-training personnel makes better use of our limited manpower resources and could be a deciding factor for a small force during combat.

The introduction of new capabilities into the RAAF without a concomitant increase in personnel brings about a situation that calls for a rationalisation of traditional service positions. The reforming of 76 Squadron, the commissioning of three OTHR sites and the proposed purchase of AEW&C aircraft indicate the incremental manpower demand facing the RAAF. If no current capability is to be deleted,

an increase in civilian establishment should be pursued to fill those positions vacated in preference for more combat-related ones. A glance at some support functions suggests no loss of combat efficiency if civilianised-- namely, clerk financial accounts, education assistant, telephone operator and a variety of training posts. As the manpower squeeze grows tighter, options such as these will need to be taken to divert service skills into more pressing positions.

Review

As with the execution of aircraft operations, the application of imagination and initiative is essential for a relatively small force to support airborne missions across the vast reaches of the north. Modern equipment can make the task easier, but the most effective use of all of the sustainment resources available is possible only by constantly analysing our reaction to a variety of credible threat situations.

Analytical thought is not the sole domain of the staff officer, and suggestions for efficient employment of assets in the north can emanate from tactical-level personnel, provided they are in possession of appropriate information. They are the ones in the firing line; hence, they are best motivated to search for a better way. Ground activities which support airborne missions are very much personnel oriented. Devising procedures that best cope with

the northern environment will result in the most productive employment of those members and lead to greater prospects for success in combat.

CHAPTER VII

CONCLUSIONS

The policy of self reliance adopted by the Hawke Government and endorsed extensively by the defence community embraces a northward and regionally-oriented stance which places emphasis on the ADF's ability to defend Australia's interests throughout the north of the country and its approaches. It represents a marked shift in Australian military posture and charges the ADF with responsibility for a vast area of land, sea and air through which any regional aggressor would have to advance.

With the increasing strategic importance of the north, each service is compelled to recognise the inherent peculiarities of this zone and to adjust its operating procedures accordingly. The geographical and climatic harshness of the region alone has a considerable impact on RAAF operations. The need for protection from nature's elements for personnel tends to be readily recognised, but similar attention to aircraft in the form of individual shelters is also deemed necessary. Whilst the conditions take their toll directly on service personnel and their aircraft, the effect on the population at large has resulted in a dearth of numbers and supporting infrastructure that serves to compound the overall military problem.

The fragile supply network servicing the remote but nationally significant communities can be fully overcome only by expensive federally-supported measures. A continued commitment by the government over an extended period is necessary to address such deficiencies even though the political short-term benefits are marginal. For its part, the military should concentrate on a course of action of prepositioning vital products in secure areas. The security of such storage areas and other important facilities on RAAF bases has been partially addressed at Tindal but needs to be extended through hardening and underground construction of certain vital assets at all bases in the north.

Despite the secure geographical location and favourable strategic outlook enjoyed by Australia, it borders on a region all too familiar with conflict. Whilst this region is currently experiencing a period of relative stability and harmony, there is nothing to suggest that the habits of hundreds of years will vanish and be replaced by enduring peace. Circumstances can change rapidly, and whilst promoting regional unity, Australia must continue on a path of protection of its wide-ranging interests without being unduly aggressive. Cocos and Christmas Islands are distinct territorial assets from a military point of view whose potential, in light of the policy of self reliance, could be optimised with careful investment.

The possession of military power has long been regarded as a major factor in establishing a country's influence, and in the context of Australia's vast northern area of interest, air power predominates in wielding such authority. The three broad doctrinal precepts which prescribe the use of air power enable its application, interwoven through a tapestry of tasks, to be more clearly understood as a incisive combat entity. This is especially relevant for a small air force whose aircraft types are compelled to fulfill a multitude of roles concurrently. However, within the continuum of responsibilities encapsulated by these doctrinal precepts exists a need to prioritize tasks in accordance with the national strategy. This is best achieved through centralised command and decentralised control.

Although the manner in which Australian air power is designed to operate may vary little from theatre to theatre, the environment of northern Australia is such that many of its exigencies require some adaptation by the RAAF to achieve maximum performance. Coordination of all of the elements of a potent air defence system to detect, identify and respond to intrusions from the north is being achieved, with its success hinging largely on the ability of the OTHR network to monitor the expansive offshore approaches. The offensive triad of RAAF aircraft is formidable in regional terms, but the inadequacy of support facilities at northern bases would hamper operations over an extended period. The

lack of indigenous aerial refuelling for the F-111 reduces the effectiveness of the RAAF's prime strike weapon, particularly when considering the likely radii of action in the north. It also underscores the expanded capability gained if we were able to refuel most of our future combat-related aircraft whilst airborne in this area of operations.

Support for land forces over the battlefield can be the most complex and lethal environment for aircraft in light of the advances in portable air defence missile systems. Despite the outstanding capacity of the Hornet to engage ground forces, consideration will have to be given to the *overall* employment of this versatile asset before committing it to such a role. Whatever combat air support is provided for the land forces, close coordination between Air Force and ground troops is vital for cohesion in the dynamic and complicated situation often experienced in the heat of a land battle. The most compelling requirement of air power from the Army's point of view will be to establish *control of the air* within the vicinity of the battlefield!

Airlift support for land and air forces assumes paramount importance in the defence of the north from both the strategic and tactical aspects. Although limited in freight carrying capability, the civil fleet should be tasked with the majority of strategic airlift in a major northward mobilisation to allow maximum use of RAAF transport assets tactically. The dearth of airfields across

the north for use by the civil fleet would place tremendous reliance on RAAF aircraft for tactical mobility in an area where few alternative sources of transport are available.

The protection of vital assets in the north, both civil and military, proved a difficult task during K89, and the RAAF must become clearly aware of the consequences of failure in this regard. The provision of a multitude of ground services is essential for combat aircraft to operate, and greater attention must be paid by the RAAF to their protection at bases in the north, mundane as it may be in comparison to air operations. More imaginative use of available strategic and operational intelligence could serve to prepare air and ground operators better for various levels of conflict and also highlight weaknesses in our own defence systems.

The unreliability of a range of services and supplies from local sources in the north necessitates the construction of a range of facilities at various bases for fuel, armament, spares and aircraft maintenance beyond the usual. Also desirable is permanent installation of C3 facilities at selected sites to allow group commanders to assert the influence of their presence directly on personnel under their command who are operating in the area.

The RAAF is presently experiencing manpower shortages, the most crucial being seasoned aircrew. Bold initiatives are called for to meet current and future

challenges, which stresses more productive use of the numbers presently within manpower ceiling limits. Greater emphasis on the employment of Air Force Reserves, cross training of ground personnel and increased civilianisation are three areas which lend themselves to more creative use of such personnel.

A recurring theme throughout this study is Australia's lack of sustainability in materiel and manpower, highlighting our vulnerability to a war of attrition. Ample historical precedent abounds for the need to take offensive action to force a favourable outcome to any conflict. Therefore, the RAAF must be prepared to go onto the offensive as soon as politically viable to resolve any conflict in the shortest possible time.

A broad range of topics has been dealt with here and the intent has been to accentuate the differences brought about by the vast distances, harsh climate and lack of supporting infrastructure that the RAAF has to contend with if it is to operate effectively throughout the northern region. The absence of a readily identifiable threat combined with constraints on expenditures make the attainment of ideal defence preparedness a challenging duty. Yet, unmistakably, the security of the nation lies in its preparedness and ability to operate throughout its northern environs. Regardless of the timeframe, the RAAF should commit itself to a program of measu ·d but unswerving

attention towards improving its northern posture. Every step the RAAF takes to enhance its competence in this region represents a sound investment in Australia's future

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7. Ibid

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9. This information was obtained from 75 SQN Hornet pilots operating from an open tarmac at Tindal in 1988 before aircraft shelters were constructed.

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13. Bureau of Public Affairs - U S Department of State, Background Notes - Indonesia April 1989, p. 1.

14. Senator the Hon. Gareth Evans, In 1987, Australia's military expenditure was $US 4.98 billion compared with Indonesia's $US 1.37 billion.

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16. The Defence of Australia, p. 21.

17. Senator the Hon. Gareth Evans, p. 31.

18. Background Notes - Indonesia, p. 5.

19. Senator the Hon. Gareth Evans, p 13.

20. Ibid p 12.

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22. Air Marshal R G Funnell, "Air Power Strategy," Air Power Global Developments and Australian Perspectives edited by Desmond Ball (Sydney: Pergamon-Brassey's Defence Publishers, 1988), p. 111.

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25. Donald H Sinnott, "The Jindalee Over-the-Horizon Radar System," Air Power Global Developments and Australian Perspectives, pp. 230, 231, 234.

26. "Kangaroo '89 Yields Valuable Lessons for Australia", Defense and Foreign Affairs Weekly, September 18-24 1989, p. 2.

27. AAP Report, "Jindalee is getting an exercise at Kangaroo 89," The Australian, August 8 1989.

28. The author is basing this statement on personal experience as a crew member on Neptune and Orion aircraft.

29. In order to differentiate between the terms "reconnaissance" and "surveillance", the definitions in the Macquarie Dictionary were consulted. The former is described as "a search made for useful military information in the field," whereas the latter was explained as "supervision" or "a watch kept over a suspect or the like." As the definition of surveillance was the most appropriate it is used as the generic term for this topic.

30. Benjamin J Lambeth, p. 84.

31. General P C Gration, An address by the Chief of Defence Force, Journal of the Royal United Services Institute of Australia, Vol 9 No 2 (June 1988), p. 50.

32. Air Marshal R G Funnell, "Air Power in the Defence of Australia," p. 7.

33.Colonel R B Bishop, "The Defence of Air Bases," Air Power Global Developments and Australian Perspectives, pp. 536, 538.

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